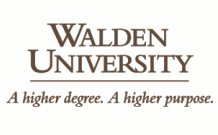

2020

Flipped Classroom Approach to a Critical Care Educational Program for New Graduates

Deborah Ann Smithers
Walden University

Walden University

College of Health Sciences

This is to certify that the doctoral study by

Deborah Smithers

has been found to be complete and satisfactory in all respects,
and that any and all revisions required by
the review committee have been made.

Review Committee
Dr. Robert McWhirt, Committee Chairperson, Nursing Faculty
Dr. Melissa Rouse, Committee Member, Nursing Faculty
Dr. Cheryl Holly, University Reviewer, Nursing Faculty

Chief Academic Officer and Provost
Sue Subocz, Ph.D.

Walden University
2020

Abstract

Flipped Classroom Approach to a Critical Care Educational Program for New Graduates

by

Deborah Ann Smithers, MSN, RN, CCRN-K

MSN, University of California Los Angeles, 2003

BSN, Molloy College, 1981

Project Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Nursing Practice

Walden University

November 2020

Abstract

Of the new graduate registered nurses hired to work in critical care areas, a few percent do not receive a formal critical care orientation. Furthermore, there is a high attrition rate of new graduates hired to work in high acuity patient care units. Many resign before their first work anniversary due to a lack of education and training. An initiative was put forth by critical care administration, at the study site, to critical care clinical leadership to significantly revise a critical care educational offering known as critical care core. The revision would allow for the satisfaction of the novice nurses who participated in the program; enhancement of critical care nursing knowledge, judgment, and critical thinking; and the creation of a quality cost-effective program. Several adult learning theories were applied to this project including Kolb's Experimental Learning Theory and Flipped Classroom learning Theory as well as the Deming plan-do-study-act model of quality improvement. The project entailed the use of a quantitative design to compare Basic Knowledge Assessment Test-9r exam scores from the former 10-day program to those of the new 2-day program utilizing a flipped classroom with blended learning methodology. The results demonstrated a notable improvement in BKAT-9r scores from 68% in 2018 (N=120) to 86.8% in 2020 (N=6). Based on the results, the program has led to social change through enhanced knowledge of critical care nursing resulting in improved patient care and nurse satisfaction. However, a larger sample is deemed necessary to render a decision on whether the revised program should be permanently implemented.

Flipped Classroom Approach to a Critical Care Educational Program for New Graduates

by

Deborah Ann Smithers, MSN, RN, CCRN

MSN, University of California Los Angeles, 2003

BSN, Molloy College, 1981

Project Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Nursing Practice

Walden University

November 2020

Dedication

This scholarly work is dedicated to my beloved mother, Rosalie Patricia Snyder, and to the success of the novice critical care nursing workforce.

Acknowledgments

I would like to thank my husband Stephen Alan Smithers and my father Ralph Daniel Snyder for their never-ending love, support, and encouragement. I am also humble and grateful for the guidance, expertise and knowledge of my committee Dr. Robert McWhirt, Dr. Melissa Rousse, and Dr. Cheryl Holly.

Table of Contents

List of Tables

Section 1: Nature of the Project

Introduction

In 2001, the Institute of Medicine (IOM) published a report describing healthcare workers as unprepared to meet diverse patient needs (Hawks, 2014, p. 264). Furthermore, in 2014, Patricia Benner identified the need to transform nursing education secondary to "profound changes in science, technology, patient activism, the market-driven health care environment, and the nature and settings of nursing practice" (Benner et al., 2015, p. 1). New graduate nurses hired to work in high patient acuity areas learn and work in less-than-optimal circumstances due to the complicated, ever-changing environment of the health care system (Benner et al., 2015). Thus, graduate nurses need to be trained to practice safely in environments where innovation is always increasing (Benner et al., 2015).

Problem Statement

One of the most significant emerging problems nursing leaders need to address is the high turnover of newly graduated nurses (Park & Jones, 2010, p. 142). The nursing literature affirms the high attrition rate of new graduates before their first year postgraduation, which may be due to inadequate training, a lack of support systems, and the stress related to high patient acuity (Bowles & Candela, 2005; Mathews & Nunley, 1992; Park & Jones, 2010). At this site, the educational critical care core program has been offered to new graduates for several years; and has undergone multiple unsuccessful revisions. In 2018, the program was 10 days and was taught using didactic lectures. The Basic Knowledge Assessment Test (BKAT-9r) was given at the conclusion of the

program to assess critical care knowledge, but the results were below the passing grade of 84%, which has been established by the authors of the exam (Toth & Ritchey, 2015). For the recent program re-design, executive nursing leadership requested the program be shortened to 2 days. To address this change, the clinical leadership at the Center for Learning and Development decided to meet the demand by implementing creative teaching strategies, which include "flipping the classroom" and using blended learning methodology. The effectiveness of the new educational program, with an objective of enhancing critical care knowledge and skills, will also be evaluated by administering the BKAT-9r exam at the conclusion of the program. Therefore, my quality improvement evaluation project entailed assessing the effectiveness of the program by comparing the BKAT-9r scores of the new 2-day program to the scores from the former 10-day program.

Purpose Statement

The purpose of this Doctor of Nursing (DNP) project was to transform a critical care nursing education program for novice nurses hired to work in adult critical care. This is based on a need to develop and implement a high-quality program to keep up with changes in science and the healthcare and nursing environment (Benner et al., 2010). Also taken into consideration was the lower than expected BKAT-9r exam scores from the previous program and program dissatisfaction.

Nature of the Doctoral Project

According to the Institute of Medicine, "quality is the degree to which health services for individuals and populations increase the likelihood of health outcomes and

are consistent with current professional knowledge" (Ward, et al., 2014, p. 343). The nature of this DNP project is an evaluation of a quality improvement project involving the education and training of new graduate nurses hired to work in the adult critical care units of a large tertiary academic medical center.

The program has undergone the following unsuccessful revisions over the past five years:

1. New critical care nurses attended what was called the Critical Care Consortium. This was a didactic program in which all new critical care nurses from several hospitals attended. This program was not successful due to inconsistencies in policies and procedures among the area hospitals.
2. New critical care nurses were enrolled in the American Association of Critical Care Nurses Essentials of Critical Care Orientation Program. The program was costly to the medical center, and completion of the modules was inconsistent as the new orientees were not held accountable for completion. This resulted in a no return on the investment.
3. New critical care nurses attended a 10-day didactic program. The program evaluations were unsatisfactory, the new nurses were dissatisfied, and the BKAT-9r scores were below the expected grade of 84%.
4. New critical care nurses attended a 5-day didactic program. The evaluations were positive, and the BKAT-9r scores were acceptable, but the learners requested simulation instead of didactic.

For this project, new critical care nurses attended a newly revised 2-day critical care core program, which included several assigned online modules, advanced cardiovascular life support, short didactic lectures to reinforce essential critical care knowledge, and high-fidelity simulation. The intended setting for this doctoral project is the Center for Learning and Development at a tertiary care medical center. Table 1 depicts how the re-designed program is integrated into a 15-week critical care orientation for novice nurses.

Table 1

Proposed Procedure and Steps for New Graduate Critical Care Orientation Educational Program

Adult Critical Care Orientation for Novice Critical Care Nurses
Week 1 • General hospital orientation (one 8-hour day). • American Heart Association Basic Life Support Class (one 8-hour day). • Novice critical care RN's spend two 12-hour shifts with preceptor on unit of hire.
Weeks 2-7 • Novice critical care RNs work three 12-hour shifts with preceptor. • Novice critical care RNs spend 4-hours per week working on the assigned Mosby's Essential Nursing Continuing Education (MENCE) modules; assigned through the Center for Learning and Developments learning management system.
Week 8 • Novice critical care RNs work two 12-hour shifts with preceptor. • Novice critical care RNs attend the two-day Critical Care Core Program.
Weeks 9-11 • Novice critical care RN's rotate to the night shift and work three 12-hour shifts with night shift preceptor.
Week 12-14 • Novice critical care RNs return to the day shift and work three 12-hour shifts independently with their preceptor serving the role of a nearby resource.
Week 15 • Adult critical care orientation is completed. • Novice critical care RNs continue working independently, with the charge nurse as a resource.
In addition to the above schedule, novice nurses will attend the following educational offerings during their orientation: • Hemodynamics (6.5-hours) • Pacemakers (4-hours) • Continuous Renal Replacement Therapy (4.5-hours) • Basic of the Intra-Aortic Balloon Pump (4-hours) • Abiomed Impella Percutaneous Ventricular Assist Device (2-hours) • Heartmate III Implanted Ventricular Assist Device (4-hours) • Advanced Cardiac Surgery Life Support (CALS)

Note. RN = registered nurse

Additionally, new nurses will attend formal critical care continuing education nursing course offerings before the completion of their 15-week orientation. These classes include ones on hemodynamics, pacemakers, and continuous renal replacement therapy. Those caring for cardiac and cardiac surgery patients would be required to attend education on intra-aortic balloon pumps, the Abiomed Impella percutaneous ventricular assist device, the Heartmate III implanted ventricular assist device, advanced cardiac surgery life support, and the Zoll Thermoguard for temperature management post-cardiac arrest. Lastly, novice nurses must participate in a virtual critical care journal club. Each month they will read an article and participate in a discussion board in the Center for Learning and Developments learning management system, which is moderated and facilitated by an education specialist.

As noted in Table 1, during Week 8, the novice critical care nurses attended the 2-day program called Critical Care Core. This program has been developed utilizing a blended learning methodology and will include videos, short didactic lectures, evolving case studies, hands-on training, and high-fidelity simulation with debriefing. At the close of the 2-day program, the attendees will take the BKAT-9r exam to assess the effectiveness of the program. The curriculum for the program is illustrated in Table 2.

Table 2

Critical Care Core Curriculum

The Critical Care Core Program	
7:00-7:15 Welcome and Introductions	7:00-8:00 Advanced cardiovascular life support Algorithm Review (group exercise)
7:15-8:00 BLS and Zoll Defibrillator Practice (hands on)	8:00-9:30 Mega Code Stations • Airway Station • ECG Interpretation Station • Mega Code Station
8:00-8:15 The Science of Resuscitation (video)	9:30-10:30 Advanced cardiovascular life support Written Exam
8:15-8:45 Acute Coronary Syndrome (video and discussion)	10:30-10:45 Break
8:45-9:00 Ischemic and Hemorrhagic Stroke (video and discussion)	10:45-11:30 Stop the Bleed Training (PowerPoint Presentation and Hands on Demonstration)
9:00-9:15 Break	11:30-12:30 Lunch
9:15-10:00 Airway Management (video, discussion, hands on)	12:30-15:30 Simulation Laboratory
11:00-12:00 Technology Review • Defibrillation • Synchronized Cardioversion • Pacing	
12:00-13:00 Lunch	
13:00-13:15 The Systemic Approach (video, discussion)	
13:15-13:30 Team Dynamics (video, discussion)	
13:30-15:30 Critical Care Pharmacology (didactic, discussion)	

Significance

New graduate nurses are leaving their first job due to a lack of education and training. This project is of significance, as it ensures a quality education program has been developed for new nurses working in critical care. The program redesign is a necessity because evaluations from the former 10-day program revealed new graduate nurses, hired to work in adult critical care units, were frustrated with the long didactic lectures. The program evaluations revealed their dissatisfaction, and the BKAT-9r exam scores were below the passing score of 84% established by the exam authors Toth and Ritchey.

Summary

Due to the ever-changing demands of the health care environment and a nursing shortage, it is not uncommon for new graduates to work in high acuity patient care areas. With this comes a need for specialized education and training, which can prepare nurses to have a foundation for working in their field (Houle et al., 1987). The goal of continuing professional education is the improvement of the ongoing performance of practitioners, which is needed to deliver high-quality patient care. This project was conducted to assess the quality of a 2-day education program, ensuring that it provides new critical care nurses with the knowledge to deliver high quality, safe, patient care.

Section 2: Background and Context

Concepts, Models, and Theories

This doctoral project was conducted to evaluate the effectiveness of a flipped classroom utilizing blended learning theory for educating new graduate nurses in critical care nursing. The flipped classroom involves both behavioral and constructivist theories, where behavioral learning theory relates to a traditional classroom and constructivist theory is based on students using their own experiences to learn (Presti, 2016). In the flipped classroom model, educators rethink how to instruct students (McDonald, & Smith, 2013), as content and learning tasks are assigned before student's experience learning in person (McGowan, Balmer, & Chappell, 2014). This allows learners to explore the material at their own pace to improve their overall understanding of the subject matter and maximize learning opportunities during the live experience (McGowan et al., 2014). There are four pillars that are essential for educators seeking to implement a flipped classroom:

- Flexible learning environments and more collaborative classroom time.
- In-class time for exploring topics in greater depth and creating richer learning opportunities, focusing on student-versus teacher-directed lectures.
- The use of intentional content and active methods of instruction selected by instructors to maximize time in and out of class, so instructional materials can be viewed as many times as needed and students benefit from the expertise of instructors as they work to apply their learning to real-world situations.

- Professional educators monitor learner progress and facilitate class sessions while having a less prominent role than traditional lecturers. (McDonald & Smith, 2013, p. 438)

In addition to the flipped classroom methodology, the project utilized Kolb's experiential learning theory. This theory describes how a learner directly experiences the topic being studied (i.e., hands-on experience; Keeton, 2004, p. 2). For nurses, this learning takes place with the preceptor at the bedside and in the simulation laboratory.

Relevance to Nursing Practice

Many nurses resign within their first year of employment. In a study surveying newly graduate nurses, "approximately 13% of the study responders had changed principal jobs after 1-year, and 37% reported that they planned to change jobs in the near future" (Park & Jones, 2010, p. 142). Inadequate training, a lack of support systems, stress related to the intense working situations, and high patient acuity are the reasons nurses are resigning during their first year of employment after graduation (Park & Jones, 2010, p. 142).

Further, there are many issues with nursing education that need to be addressed. Based on the IOM's Future of Nursing Report, nursing education needs to fit better with practice and be more interactive to prevent boredom (Finkelman & Keller, 2012). Additionally, learning needs to be focused on what new nurses need to know including where to find what they need to know (e.g., policies and procedures, hospital intranet, continuing education programs offered by the Center for Learning and Development). Finally, learner feedback, both written and verbal, is necessary (Finkelman & Keller,

2012). The relevance of this DNP project is to assess that a high-quality educational program is offered to new critical care nurses hired to work in the adult critical care service line. Such a program would result in staff satisfaction and retention.

Local Background and Context

The medical center is a 1,000-bed tertiary academic medical center located in upstate New York. It is important to note, the critical care service line is highly decentralized, with five specialized adult critical care units, which makes a generalized critical care educational program challenging. Therefore, the program offers an introduction to critical care nursing, with specifics taught on the different intensive care units by clinical nursing leadership (clinical nurse specialists, nurse clinicians, or nurse educators). One might ask why the project team did not consider the well-known American Association of Critical Care Nurses Essentials of Critical Care Orientation program? As noted earlier, this was once implemented and unsuccessful. Therefore, executive nursing leadership would not allow this to be an option. To members of the clinical leadership for critical care previously worked in academia, and thought perhaps using a blended, flipped classroom format would be worthwhile, given the new nurses are of a generation that is computer savvy, and many were used to online education.

To keep in the spirit of a blended, flipped classroom format. The project team decided to utilize the already available Mosby Essential Nurse Continuing Education (MENCE) modules for critical care. The modules would be pre-assigned with tracking by the various unit's clinical nursing leadership.

Role of the Project Team

According to Polifko-Harris & Anunciado (2014), "to be an effective team member, you need to possess certain characteristics conducive to team collaboration. You must be proactive, motivated, have a certain personal sense of purpose or mission, and possess personal and time management skills (p. 276). The team assembled for this project was comprised of the clinical nurse specialists and nurse clinicians working in the adult critical care units.

Victor-Chmil (2013) states, "critical thinking is the cognitive process used for analyzing knowledge. Clinical reasoning is the cognitive and metacognitive processes used for analyzing knowledge relative to a clinical situation or specific patient. Clinical nursing judgment is the cognitive, psychomotor, and affective processes demonstrated through actions and behaviors. Together, these processes lead to competent nursing practice" (p. 34). In terms of the program, an assessment will be made, in the simulation laboratory, through various critical care simulations using the Lasater Simulation Rubric.

Furthermore, since the critical care service line is decentralized, with 5 adult critical care units, the project team needed to be in alignment with the development and implementation of a new program. The project team conducted a literature search for current evidence-based practice on the flipped classroom and blended learning methodology and reviewed pertinent literature. There was also a review of the most current National Council Licensing Exam test plan for registered nurses. Since the team was tasked with reducing the length of the program from 10-days to three day, it was agreed to build upon the basic critical care knowledge that was learned in nursing school,

as evidenced by the National Council Licensing Exam-RN test plan. Lastly, the team agreed on which of the MENCE modules would be assigned, and the need for close tracking and timely completion.

Role of the Doctorate in Nursing Practice Student

The role of the writer is to be unbiased and evaluate the revised and redesigned two-day program. The writer will assess for quality, and the attainment of fundamental critical care nursing knowledge by comparing the BKAT-9r exam scores to those from the previous 10-day program.

Summary

One may not think of quality improvement when assessing a professional educational offering. However, the proposed program is of the utmost importance to the adult critical care service line. The quality improvement model, the Deming plan-do-study-act cycle, will be utilized to assess the quality of the program. The Agency for Healthcare Quality and Research defines the PDSA cycle as a "four-step cycle that allows for the implementation of change, solve problems, and continuously improve processes. Its cyclical nature allows the model to be utilized continuously for ongoing improvement" (Agency for Healthcare Quality and Research, n.d.).

- Plan: The goal of this quality improvement project is to assess the redesign of a critical care educational program known as Critical Care Core.
- Do: New graduate nurses will be assigned the critical care MENCE modules through the medical centers learning management system. Timely completion will be monitored by clinical nursing leadership.

- Study: The data from the BKAT-9r exam scores will reveal whether the change was effective in the attainment of essential critical care knowledge.
- Act: If successful, the program will be offered every other month (six times a year), and the BKAT-9r scores closely monitored.

Section 3: Collection and Analysis of Evidence

Practice-Focused Question

The practice-focused question for this DNP project addressed the quality and effectiveness of an orientation program for new critical care nurses utilizing a flipped classroom with a blended learning methodology. The practice-focused question for this DNP quality improvement project is "For new graduate nurses working in adult critical care units does a 2-day educational program utilizing a flipped classroom with blended learning methodology, as opposed to a traditional classroom setting, 10-day program, enhance critical care knowledge and skills, as measured by the BKAT-9r exam?"

Sources of Evidence

It is important for new nurses to be prepared to meet diverse patients' needs, be leaders, and advance science to improve quality of care (IOM, 2011, p. 164). Furthermore, new nurses need to be prepared to practice in varied settings and continue learning (Benner, 2010, p. 1). Therefore, there needs to be a transformation in nursing education to focus on knowledge relevant to particular situations, combine clinical and classroom teaching, and emphasize clinical reasoning with multiple ways of thinking (Benner, 2010).

Though there needs to be a change in nursing education, there is little research on the utilization of a flipped classroom for nursing orientation educational programs. Most literature published is related to formal nursing education. The "flipped classroom is a hybrid approach to learning, using technology to move the classroom lecture to homework status and using the face-to-face classroom time for interactive learning"

(Missildine et al., 2013, p. 598). Billings et al. (2013) concluded, “the flipped classroom has the potential to increase access to and provide greater efficiencies for individualized delivery of instruction, and the student-centered approach allows learners to master content, as the director of their learning, and educators to deploy teaching strategies on the classroom to facilitate active learning” (p. 438). Research has shown in a comparison of flipped classroom pedagogy to a traditional lecture program that those assigned to the flipped classroom cohort demonstrated a 4% increase in retention of content compared to those attending a conventional didactic educational program (Shatto, L’Ecuyer, & Quinn (2017, p. 207). Please refer to Table 3 for more information on the literature from the literature review.

Table 3

Literature Review

Source	Framework	Purpose	Methodology	Results	Conclusion	Future research
Dehghanzadeh & Jafaraghaee (2018)	Critical thinking disposition.	Determine critical thinking disposition on Iranian BSN students by comparing the effects of traditional lecture versus flipped classroom.	Pretest-posttest quasi-experimental study involving 85-second year BSN students. divided into two groups: flipped classroom and traditional lecture.	There were higher mean scores of critical thinking disposition and engagement in the flipped classroom group.	The flipped classroom approach promotes critical thinking disposition.	Further studies are needed to produce more credible results.
Shatto, L'Ecuyer, & Quinn (2017)	Retention of content and accountability for learning.	Evaluate the retention of content and accountability for learning by comparing flipped classroom to traditional lecture.	Pilot study to compare the experience of cohort nursing students with a flipped classroom versus traditional lecture using the standardized HESI medical - surgical nursing exam.	Nursing students in the flipped classroom cohort showed a 4% increase to those who were in the traditional lecture cohort.	The flipped classroom pedagogy improved both student learning and satisfaction; thus, students may be more satisfied and accountable with self-directed learning. .	The study needs repeating with a larger sample and greater geographical and racial diversity.
Saunders, Green, & Cross (2017)	Person-centered care, the role of the professional nurse, and preparation for their first nursing career.	Determine whether flipped classroom prepares nurses adequately for their first professional placement.	Exploratory study with a survey, interview, and focus group	Over 90% of the students felt the flipped classroom prepared them to be successful.	The flipped classroom increased student satisfaction, promoted person-centered care, enhanced transition to the professional nurse's role, and prepared nurses for their first career as a professional nurse.	The authors feel additional research is justified to examine the potential for the blended flipped classroom to facilitate higher-order student learning outcomes.

(table continues)

Source	Framework	Purpose	Methodology	Results	Conclusion	Future research
Betihavas, Bridgman, Kornhaber, & Cross (2016)	Flipped classroom	Examine the evidence for flipping the classroom in higher education nursing programs.	Systemic review using a critical appraisal tool to evaluate the literature.	Five studies were reviewed providing insight into the implementation and outcomes of the flipped classroom in nursing programs	Additional research is warranted.	Additional research is needed to examine the implementation process, value of pre- and within class active learning strategies, and the outcome of the flipped classroom using alternative measures.
Presti (2016)	Flipped classroom	Determine what is known about the flipped classroom approach in undergraduate, graduate, and post-graduate nursing education	Integrative literature review.	Ninety-four articles were reviewed, of which 13 met criteria of the flipped classroom approach to nursing education.	Synthesis of the findings revealed the flipped classroom approach can have positive results.	Further research is needed to guide implementation of a flipped classroom for nursing education.
McCutcheon, Lohan, Traynor, & Martin (2014)	Flipped classroom versus traditional classroom	Determine whether online or blended learning can enhance the teaching of clinical skills in undergraduate nursing.	Mixed methods systemic review.	Nineteen published articles were reviewed, with only two reporting on a blended approach to nursing education.	Online education for teaching clinical skills is no less effective than traditional teaching.	Further research is necessary to assess the effectiveness of the blended learning methodology.
Missildine, Fountain, Summers, & Gosselin (2013)	Innovative teaching methods on the academic success of BSN students.	Examine the difference among lecture only, lecture plus capture, and lecture capture with innovation teaching methodologies on mean scores and assess the differences in student satisfaction among the three different educational delivery systems.	Quasi-experimental study	More students passed the examination using the lecture capture with teaching innovation methodology, but it did not enhance student satisfaction.	Blending new teaching methodologies with interactive classroom activities can result in improved learning but not necessarily student satisfaction.	A replication study is needed to explore the use of social media for students, what ratio of lecture classes to innovative methods, is there a difference in course grades and student satisfaction with different educational pedagogies, which teaching methods are more effective in teaching specific content.

Analysis and Synthesis

The BKAT-9r is an 85- question exam written by Toth and Ritchey and is utilized by critical care nurse educators to measure basic knowledge in critical care nursing. This basic knowledge refers to information necessary to safely treat patients, which goes beyond the knowledge that is required for licensure (Toth, 2003). The goal of a critical care orientation program is to ensure the staff nurses have an understanding of this basic knowledge (Toth, 2003, p. 41).

Summary

The literature revealed evidence identifying a need for professional education and training to ensure the provision of high-quality, safe patient care. There is a need for learners to be self-directed (Benner, 2010). Literature has revealed that the use of a flipped classroom results in self-directed learning and increases content retention and mastery of content. By evaluating a flipped classroom program, this educational quality improvement project will provide new critical care nurses with the necessary critical thinking, clinical reasoning, and clinical nursing judgment to be successful and satisfied.

Section 4: Findings and Recommendations

Introduction

Approval was received for this DNP project by the Walden Institutional Review Board (approval number 03-31020-056439). The evaluation of the revised critical care core, utilizing a flipped classroom and blended learning methodology, was done through the administration of the BKAT-9r exam. The goal was to have BKAT-9r scores ≥ 84%.

Findings and Implications

In 2018, from the former 10-day didactic program known as critical care core, the BKAT-9r exam average score was 68.4 out of a sample size of 120. For 1 month from the newly revised 2-day critical core program, the average score was 86.8 for a sample of eight. Although the results are much improved, an 18.4-point increase, it is important to note that the exam was administered once; and a large sample size is needed.

Recommendations

Although a small sample, the new educational program, utilizing the flipped classroom and blended learning theory, resulted in the project goal of improved BKAT-9r exam scores. The improved scores may be due to the nature of flipped classrooms, as it is a model where class time is used for relevant discussion and problem solving (Phillips, 2020)."

Phillips also identified the flipped classroom as one that allows "students to be prepared for in-class conceptual knowledge and thinking and learning activities and their application to practice" (p. 292). As this was an evaluation of a quality improvement project, the goal of the provision of a quality educational program with improved BKAT-

9r exam scores was accomplished. However, I recommend the continuation of the program, which can yield a larger sample for a more accurate comparison of the two programs.

Contributions of the Doctoral Project Team

There were several clinical nurse leaders involved in the project. But three were uncomfortable with teaching in a classroom or not knowledgeable of teaching in a simulation laboratory, which resulted in two who were former nurse educators from an academic setting becoming solely responsible for the program. There was also inconsistent monitoring of timely completion of the assigned learning management system modules. This often became the responsibility of the two clinical nurse leaders overseeing the 2-day program.

Strengths and Limitations of the Project

There were both noted strengths and limitations to the DNP project. Strengths include the clinical nursing leadership who instructed at the 2-day program. They have experience as being nurse educators, critical care subject matter experts, and have experience with high-fidelity simulation. They also made a strong commitment to developing a high-quality critical care orientation program. The evaluations by the participants were positive, and the 2-day program was highly evaluated. Another strength was the high quality of the MENCE modules offered through the medical center's learning management system. The new nurses seemed well prepared and were able to participate in discussions, evolving case studies, and perform in the simulation laboratory.

The major limitation of the project was the COVID-19 pandemic, resulting in social distancing and the suspension of the 2-day critical care core program. The solution to overcome the limitation is to make the program 100% online. This could be accomplished by utilizing the American Heart Association Heart Code Program, in place of the instructor led, hands-on advanced cardiovascular life support Provider Course (American Heart Association, 2020). The Heart Code advanced cardiovascular life support program is a "self-directed, comprehensive e-learning program that uses e-Simulation technology to allow students to assess and treat patients in virtual health care settings" (American Heart Association, 2020). Although the training is online, the participants need to also participate in a hands-on session to demonstrate skill. The hands-on session could be done one-on-one with a member of the critical care leadership team.

Another limitation is the high-frequency simulation laboratory, where there are six novice nurses with the two critical care clinical leadership members. The simulation portion of the program could be replaced with online virtual simulations. The vSim product, developed by Laerdal Medical and Wolters Kluwer, offers a solution, as it assesses nursing judgment, critical thinking, and patient safety. The product offers several high acuity simulations, including the patient experiencing a myocardial infarction, diabetic ketoacidosis, compartment syndrome, pulmonary emboli, congestive heart failure, cardiac arrest, post-operative over sedation, bowel obstruction with fluid and electrolyte imbalances, post-operative blood transfusion reaction, pneumothorax, and pneumonia. Additionally, the product administers a pre-simulation quiz and a post-

simulation quiz. I have proposed to clinical critical care nursing leadership to make the passing grade on the post-simulation quiz 84%, similar to the BKAT-9r exam. The decision on this proposal is pending.

Finally, in the simulation laboratory, the Lasater Clinical Judgement Rubric was utilized to assess clinical judgment and patient safety. This was not an adequate assessment rubric with the vSim® product. Therefore, I developed an analytic scoring rubric that assesses nursing judgment and patient safety (see Table 4). According to McDonald (2018), "the clear advantage of the analytic method is that it provides information about the students' strengths and weaknesses" (p. 195). The rubric is able to identify if the student uses sound nursing judgment and provides safe patient care. Table 4 below is the newly developed vSim® Analytic Rubric. Because the program will become 100% online, the responsibility of assessing the novice nurses' vSim experience will become the responsibility of the critical care units clinical nurse leaders.

Table 4

Revised Rubric

	Exceptional	Exceeds expectations	Meets expectations	Unacceptable	Total
			5 points	0 points	
Performance on the Pre-Simulation Quiz			The pre-test was attempted and completed.	The pre-test was not completed or attempted but not completed.	
	70 points	60 points	50 points	0 points	
Performance with the Virtual Simulation	The novice critical care RN demonstrated nursing judgment with a simulation score of 95-100%, which includes risk level for patient harm.	The novice critical care RN demonstrated nursing judgment with a simulation score of 90-94%, which includes risk level for patient harm.	The novice critical care RN demonstrated nursing judgment with a simulation score of 84-89%, which includes risk level for patient harm.	The novice critical care RN demonstrated nursing judgment with a simulation score of 0-83%, which includes risk level for patient harm.	

	25 points	0 points	15 points	0 points
Performance on the Post-Simulation Quiz	The novice critical care RN earned a score of 95-100% on the post simulation quiz.	The novice critical care RN earned a score of 90-94% on the post simulation quiz.	The novice critical care RN earned a score of 80-89% on the post simulation quiz.	The novice critical care RN earned a score of score of ≤ 79% on the post simulation quiz.
Total score				

Section 5: Dissemination Plan

Analysis of Self

My interest in this DNP project is trifold: through the lens of a former critical care nurse administrator, the lens of a critical care nurse educator, and the current lens of an academic faculty member. Therefore, the success, satisfaction, and retention of the new graduate nursing workforce is of great importance to me. To ensure the success of the new graduate nursing workforce, they need to receive a quality education and professional development to be able to critically think, apply clinical knowledge, and use clinical judgment. In analyzing myself as a nurse educator, I have chosen to assess my role in this quality improvement project by using the National League of Nurses (NLN) Core Competencies for Nurse Educators. The following NLN Core Competencies applied to my project role.

Competency III: Use Assessment and Evaluation Strategies

This competency refers to using a variety of strategies to evaluate student learning in multiple settings like the classroom and clinical setting (NLN, 2020). In nursing education, Halstead (2020) states, "evaluation is a systemic, ongoing process that begins with specifying expected or desired outcomes, providing opportunity to attain the expected outcomes, measuring achievement and receiving feedback about progress towards attaining the expected outcomes, and ending with evaluation or a judgment about the extent to which the expected outcomes were attained" (p. 437). With regard to this project, the BKAT-9r exam scores were ≥ 84%, and performance in the simulation laboratory, which was evaluated using the Lasater Clinical Judgment Rubric, revealed

proficiency in critical judgment, clinical knowledge, and critical judgment. The program evaluations also revealed a high level of satisfaction with the program.

Competency V: Function as a Change Agent and Leader

This competency refers to nurse educators being agents who create a better future for nursing education (NLN, 2020). According to Pfendt and Anderson (2014), change agents "manage the dynamics of the change process. The role requires knowledge of the organization, knowledge of the change process, knowledge of the participants in the change project, and an understanding of the feelings of the group undergoing the change" (p. 307). As the Critical Care Educational Specialist for the adult critical care survive line, I was asked to fulfill the role of co-chair of the team responsible for the significant revision based on being a subject matter expert of nursing education and critical care nursing. The group undergoing the change were new graduates hired to work in the adult critical care units. The change also took into consideration the former new graduates who had attended the previous 10-day program, as their input was valuable in selecting the flipped classroom method of teaching coupled with blended learning theory.

Competency VI: Pursue Continuous Quality Improvements int the Nurse Educator Role

This competency refers to nurse educators acknowledging an ongoing commitment to their role (NLN, 2020). To ensure the success of this project, the program needs to run as planned and be evaluated every month. I recommend a monthly review the BKAT-9r scores, program evaluations, and critical care attrition rates of new graduates.

Competency VIII: Function Within the Educational Environment

This competency refers to nurse educators being knowledgeable about the nursing environment and forces that can influence their role (NLN, 2020). This competency applies to Boyer's scholarship of teaching. Fisher (2020) stated, "The scholarship of teaching requires evidence of effective teaching and dissemination of knowledge that is acquired as a result of teaching" (p. 9). Fisher continued, "the scholarship of teaching provides nursing faculty with the opportunity to demonstrate their innovation and creativity. It also provides a means for recognizing the effort spent preparing students to be competent health care providers" (p. 9). For this project to be successful, an alternative needed to be identified that would be both cost-effective and of quality; the MENCE modules far exceeded expectations. The content was current, presented in a way that was easy to understand, and held the learners' attention. Critical care nursing knowledge was noted in the simulation laboratory and the BKAT-9r exam scores.

Summary

The critical care education program underwent a significant revision that went beyond the traditional classroom and made new critical care nurses' partners in their critical care orientation by giving them accountability and responsibility for completing online learning modules before attending a 2-day program. Though the COVID-19 pandemic resulted in the temporary suspension of the program, the program can be 100% online by incorporating online virtual simulation to replace the training previously rendered in the simulation laboratory and advanced cardiovascular life support heart code to replace the live advanced cardiovascular life support provider course.

References

Agency for Healthcare Research and Quality. (n.d.). *Health information technology: Best practices, transforming quality, safety, and efficiency*. Retrieved from https://healthit.ahrq.gov/health-it-tools-and-resources/evaluation-resources/workflow-assessment-health-it-toolkit/all-workflow-tools/plan-do-check-act-cycle

American Heart Association. (2020). Advanced cardiovascular life support (ACLS) course options. Retrieved from https://cpr.heart.org/en/courses/advanced-cardiovascular-life-support-course-options

Benner, P., Sutphen, M., Leonard, V., & Day, L. (2010). *Educating nurses: A call for radical transformation*. San Francisco, CA: Jossey-Bass.

Bowles, C., & Candela, L. (2005). First job experiences of recent graduates: Improving the work environment. *Journal of Nursing Administration*, *35*(3), 130-137. doi:10.1097/00005110-200503000-00006

Finkelman, A., & Kenner, C. (2012). Part four: Nursing education and the IOM reports: critical issues and the implications for the curriculum. In A. Finkelman & C. Kenner (Eds.), *Teaching IOM: Implications of the Institute of Medicine Reports for Nursing Education* (3rd ed., pp. 57-87). Silver Spring, MD: American Nurses Association.

Halstead, J. A. (2020). Introduction to the evaluation process. In D. M. Billings & J. A. Halstead (Eds.), *Teaching in nursing: A guide for faculty* (6th ed., pp. 437-449). St. Louis, MO: Elsevier.

Houle, C. O., Cyphert, F., & Boggs, D. (1987). Education for the professions. *Theory into Practice*, *26*(2), 87-93. doi:10.1080/00405848709543255

Keeton, M. T. (2010). Sage reference: Experiential learning. In A. Distefano, K. E. Rudestam, & R. J. Silverman (Eds.), *Encyclopedia of distributed learning* (pp. 2-4). Thousand Oaks, CA: Sage.

McDonald, K., & Smith, C. M. (2013). The flipped classroom for professional development: Part I. Benefits and strategies. *The Journal of Continuing Education*, *44*(10), 437-438. doi:10.3928/00220124-20130925-19

McGowan, B. S., Balmer, J. T., & Chappell, K. (2014). Flipping the classroom: A data-driven model for nursing education. *The Journal of Continuing Education in Nursing*, *45*(11), 477-478. doi:10.3928/00220124-20141027-11

National Council of State Boards of Nursing. (2019). *Entry level nurse demographics 2017- 2019*. Retrieved from http://www.ncsbn.org

National League of Nurses. (2020). *Nurse educator core competency*. Retrieved from http://www.nln.org

Park, M., & Jones C. (2010). A retention strategy for newly graduated nurses. *Journal for Nurses in Staff Development*, *26*(4), 142-149. doi:10.1097/nnd.0b013e31819aa130

Pfendt, K. E., & Anderson, M. M. (2014). Change, innovation, and conflict management. In Kelly, P. (Ed.), *Nursing Leadership & Management* (3rd ed., pp. 297-321). Clifton Park, NY: Delmar.

Phillips, J. M. (2020). Strategies to promote student engagement and active learning. In

D. M. Billings & J. A. Halstead (Eds.), *Teaching in nursing: A guide for faculty* (6th ed., pp. 292-293). St. Louis, MO: Elsevier.

Shatto, B., L'Ecuyer, K., & Quinn, J. (2017). Retention of content utilizing a flipped classroom approach. *Nursing Education Perspectives*, *38*(4), 206-208. doi:10.1097/01.nep.0000000000000138

Toth, J. C. (2002). Comparing basic knowledge in critical care nursing between nurses from the United States and nurses from other countries. *The American Journal of Critical Care*, *12*(1), 41-46. doi:10.4037/ajcc2003.12.1.41

Toth, J. C., & Ritchey, K. (2015). *The Basic Knowledge and Assessment Test for Adult Critical Care Nursing* (version 9). Retrieved from http://www.bkat-toth.org/BKAT-8.html

Victor-Chmil, J. (2013). Critical thinking versus clinical reasoning versus clinical judgment: Differential diagnosis. *Nurse Educator*, *38*(1), 34-36. doi:10.1097/nne.0b013e318276dfbe

Ward, K.L., Jadlos, M.A., Kelman, G.B., McLaughlin, M., Houston, K., & Mattson, E.H. (2014). Quality improvement and evidence-based patient care. In P. Kelly and J. Tazbir (Eds.), *Essentials of nursing leadership & management* (3rd ed., p.343). Clifton Park, NY: Delmar Cengage Publishing.

Warren, K. (2014). Quality improvement: Foundation, processes, tools, and knowledge transfer techniques. In M. S. Joshi, E. R. Ransom, D. B. Nash, & S. B. Ransom (Eds.), *The healthcare quality book: Vision, strategy, and tools* (3rd ed., pp. 83-107). Chicago, IL: Heath Administration Press.